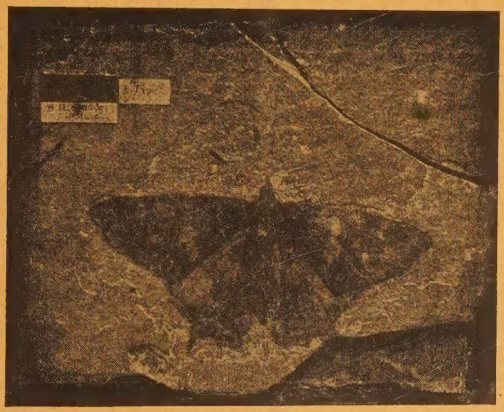
PSYCHE

A JOURNAL OF ENTOMOLOGY

ESTABLISHED IN 1874

VOL. XXV AUGUST, 1918 NUMBER 4



Prodryas persephone Scudder.

CONTENTS.

Synoptic Keys to the Lygæidæ (Hemiptera) of the United States. *H. G. Barber* 71

Another *Toxoptera* Feeding on Sedge (Homoptera; Aphididæ). *A. C. Baker* 88

A New Species of Evania from the Cameroons (Hymenoptera; Evaniidæ). *C. T. Brues* 93

The Breeding of Mosquitoes in Alkaline Water. *H. L. Ballowe* 96

Exchange Column 97

CAMBRIDGE ENTOMOLOGICAL CLUB.

OFFICERS FOR 1918.

President . . . . . W. M. WHEELER.
Vice-president . . . . . S. W. DENTON.
Secretary . . . . . A. C. KINSEY.
Treasurer . . . . . H. A. PRESTON.
Executive Committee
A. F. BURGESS, F. W. DODGE, C. A. FROST.

EDITORIAL BOARD OF PSYCHE.

EDITOR-IN-CHIEF.
C. T. BRUES, Harvard University.

ASSISTANT EDITOR.
R. W. GLASER, Harvard University.

ASSOCIATE EDITORS.

C. W. JOHNSON,
Boston Society of Natural History.

V. L. KELLOGG,
Stanford University.

A. L. MELANDER,
Washington State College.

A. P. MORSE,
Wellesley College.

J. H. EMERTON,
Boston, Mass.

J. G. NEEDHAM,
Cornell University.

W. M. WHEELER,
Harvard University.

PSYCHE is published bi-monthly, the issues appearing in February, April, June, August, October and December. Subscription price, per year, payable in advance: $1.50 to subscribers in the United States, Canada or Mexico; foreign postage 15 cents extra. Single copies, 35 cents.

Cheques and remittances should be addressed to H. A. PRESTON, 17 East Highland Ave., Melrose Highlands, Mass.

Orders for back volumes, missing numbers, notices of change of address, etc., should be sent to Dr. R. W. GLASER, Bussey Institution, Forest Hills, Boston, Mass.

IMPORTANT NOTICE TO CONTRIBUTORS.

Manuscripts intended for publication, books intended for review, and other editorial matter should be addressed to Professor C. T. BRUES, Bussey Institution, Forest Hills, Boston, Mass.

Authors contributing articles over 8 printed pages in length will be required to bear a part of the extra expense for additional pages. This expense will be that of typesetting only, which is about one dollar per page. The actual cost of preparing cuts for all illustrations must be borne by contributors; the expense for full page plates from line drawings is approximately $3.60 each, and for full page half-tones $4.80 each, smaller sizes in proportion.

REPRINTS OF ARTICLES CAN BE SUPPLIED AT THE COST OF PRINTING.

No reduction can be made for less than 50 copies of reprints.

Entered as second-class mail matter at the Post Office at Boston, Mass. Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized on June 29, 1918.

PSYCHE

VOL. XXV AUGUST, 1918 No. 4

SYNOPTIC KEYS TO THE LYGÆIDÆ (HEMIPTERA) OF THE UNITED STATES.

By H. G. Barber,
Roselle Park, New Jersey.

PART II. RHYPAROCHROMINÆ.

As indicated by Stål the most important character for differentiating this subfamily is the peculiarity of the incisure between the third and fourth ventral abdominal segments which laterally curves forward and does not reach the lateral margin of the abdomen. *Plinthisus* is about the only exception to this among United States genera. The presence of two setæ, set close to each eye, is also characteristic of the group. Stål (Öfv. Vet.-Akad. Förh 1872) first divided this subfamily into six divisions: Myodocharia, Rhyparochromaria, Beosaria, Gonianotaria, Lethæaria, and Drymaria. Two years later (Stål, Enum. Hemipt. Pt. 4, 1874), in constructing a synopsis to include extra-European genera, Stål added Cleradaria, combined Drymaria with Lethæaria and omitted all mention of the Gonianotaria. Accepting Stål's arrangement this subfamily is therefore composed of six main divisions which Mr. Van Duzee has recently termed tribes to bring them more into accord with modern system of nomenclature. In separating certain of his divisions Stål relied principally upon two characters—the position of the two opaque spots of the fourth ventral abdominal segment in reference to each other and the character of the lateral margin of the pronotum. Owing to the difficulty of interpreting these characters exactly in every case or owing to their variability the accuracy of Stål's divisional arrangement has been called in question by several Hemipterists. Distant (Biol. Cent. Amer., p. 212, 1882) recognizes Myodocharia and combines all of the other divisions under Rhyparochromaria, stating that "I have here failed to interpret his [Stål's] meaning sufficiently to prevent confusion." Bergroth (Ann. Soc. Entomol.

Belg., p. 153, 1913) has more recently advocated the union of the Lethæini and Rhyparochromini in the following words: "After examination of many specimens of *Microcoris* and other exotic Myodochinæ I believe, however, that the number and position of the glandular spots have been overrated as a systematic character by Stål. One or other of these spots is sometimes lacking, at least on one side of the body. I therefore unite the Lethæaria with the Rhyparochromaria. . . ."

After a careful study of all the United States genera, in preparation for my revision of this subfamily, I am convinced that, so far at least as our fauna is concerned, Stål's divisional diagnosis will apply in separating the genera off into well defined groups. However my knowledge of palæarctic and exotic genera of Rhyparochrominæ is too limited, at the present time, to permit me to determine how well this scheme applies beyond our limits. Hence without more evidence than we have at the present time I am reluctant to abandon Stål's scheme of divisions.

As it is obviously impossible, in a paper of this character, to enter into explanations, I have found it necessary to publish elsewhere such modifications of or additions to the present scheme, which I have here proposed. It will be noted that although I have adopted Stål's divisions I have modified the wording somewhat, in order to bring out the relative importance or the greater significance of certain characters. Attention must also be called to the fact that the species mentioned in connection with certain genera is not necessarily the type unless so indicated.

KEY TO THE TRIBES OF SUBFAMILY RHYPAROCHROMINÆ.

A. The two basal segments of the rostrum together not at all or scarcely longer than the head, third segment longest of all. Posterior glandular opaque spot of the fourth ventral segment remote from the apical margin. Ocelli very widely separated. . . . . *Cleradini* Stål.

AA. The two basal segments of the rostrum much longer than the head, the first segment as long or nearly as long as the head. Ocelli not so widely separated.

B. With the two glandular opaque spots laterally on the fourth ventral segment, widely separated, the posterior one placed closer to the posterior margin than to the anterior spot.

C. Pronotum with the lateral margins of the anterior lobe obtuse, terete, neither calloused, carinate nor expanded nor longitudinally impressed within the lateral margin of the propleura; most commonly strongly constricted transversely to form two distinct lobes and most commonly provided with a constricted ring-like collar. [If collar is absent then is the head not at all or very lightly exserted (see Div. CC.). Body commonly less depressed, more narrow elongate.] ..... *Myodochini* Stål.

CC. Pronotum with the lateral margins of the anterior lobe not obtuse or terete but either calloused or carinate or expanded or the lateral emargination filled in by a foliaceous expansion or furnished within the lateral margin with a series of punctures or the propleura with a linear impression within the lateral margin. Pronotum rarely strongly constricted transversely, if so then is the lateral margin carinate or expanded or the lateral emargination filled in by a foliaceous expansion, or the propleura impressed within the lateral margin; rarely furnished with a constricted ring-like collar unless the head is strongly exserted or at most only provided with a depressed series of punctures within the anterior margin. Body most commonly broad with the head most commonly, almost or quite immersed to the eyes.

D. Lateral margins of the pronotum not at all or less entirely laminate-expanded, most commonly either carinate or longitudinally impressed within the lateral margin of the propleura. Pronotum most commonly entirely black, ferrugineous or castaneous, with the posterior lobe rarely paler, punctuate with black. [Head rarely strongly exserted, if so, then is the constricted collar present anteriorly on the pronotum (Ozophora). Hind tibia most commonly without rigid bristles only, most frequently pilose.] ..... *Rhyparochromini* Stål.

DD. Entire lateral margin of the pronotum and costa [more or less] laminate-expanded (in U. S. genera) and most commonly in part pale; this margin rarely only keeled (in certain exotic genera), in which case the first segment of the antenna is extended far beyond the apex of the head

and the genital segment of the male is tuberculate; pronotum (including margin) most rarely entirely black, posterior lobe most commonly pale or variegated with pale. Posterior tibia furnished with long rigid subspiniform setæ [bristles].

E. Antennæ nude or with shorter pubescence, first segment sometimes furnished with a few shorter setæ. Lateral [more narrowly] expanded margin of the pronotum not at all or rarely sparingly punctate; anterior disk of the pronotum most commonly smooth or sparingly punctate, rarely densely punctate. . . . . *Beosini* Stål.

EE. Three basal segments of the antennæ provided with rigid setose bristles. Lateral [more widely] expanded margin of the pronotum and corium commonly [profusely] punctate. Clavus irregularly punctate. Dorsal parts commonly pale [and profusely punctate]
Gonianotini Stål.

BB. The posterior glandular, opaque spot of the fourth ventral segment of the abdomen placed closer to anterior spot, most remote from the posterior margin of the segment, sometimes furnished with a third, posteriorly placed, spot. [With lateral margin of pronotum most commonly expanded, this frequently foliaceous between the lobes.] . . . *Lethœini* Stål.

Tribe Myodochini Stål.

A. Head very much exserted, drawn out into a long cylindrical neck at base; longer than pronotum. Two lobes of pronotum subequal. Body narrow elongate. Hind tibia furnished with long, setose hairs. Basal segment of hind tarsus about three times as long as second and third together. Macropterous forms only. . . . . *Myodochus* Oliv.

AA. Head either exserted or not, but never drawn out into a long cylindrical neck. Collar more rarely absent (see Div. CC.).

B. Pronotum commonly constricted at middle or a little behind middle; anterior lobe in all macropterous forms and in most brachypterous forms never or scarcely ever more than twice as long as posterior lobe, if more than doubly longer then the head is not exserted (as in brachypterous forms of some *Ptochiomera*).

C. Head more or less distinctly exserted. Pronotum with a constricted ring-like collar. Body more or less elongate.

D. Head strongly exserted, forming a short neck at base; the postocular space about four times as long as the space between the antenna and eye. The eyes placed about midway on the head. Hind tibia provided with fine rigid bristles. Basal segment of posterior tarsus about as long as second and third together. Macropterous and brachypterous forms..... *Heræus* Stål.

DD. Head much less exserted, commonly strongly contracted back of eyes; postocular space commonly subequal to or sometimes shorter than space between base of antenna and eye.

E. Anterior lobe of pronotum, especially in brachypterous forms, globose, almost the diameter and about twice the length of posterior lobe. Postocular space subequal to space between antenna and eye. Scutellum much longer than wide. Head and pronotum shining. Hind tibia with rigid bristles. Posterior tarsus with first segment nearly three times as long as second and third together. Macropterous and brachypterous forms. *Sphærobius* Uhl.

EE. Anterior lobe of pronotum not so evidently globose and narrower than posterior lobe. Head and thorax seldom shining. Basal segment of posterior tarsus most commonly not more than twice as long as second and third together, if three times as long as second and third then the posterior tibia is provided with long rigid bristles.

F. Preocular space to base of antenna about three times as long as postocular space; head not strongly contracted back of eyes; apex of tylus not extended to middle of basal segment of antenna; this segment incrassate and elongate, a little longer than basal segment of rostrum; second segment very elongate, over twice as long as the third or fourth, longer than third and fourth together. Pronotum with anterior lobe twice as long as posterior. Collar set off by a depressed series of punctures. The anterior femora armed with two rows of spines, the outer series confined to the subapex.

The posterior tibia provided with a few scattered setose hairs similar to those of antennæ. Hind tarsus with basal segment about twice as long as second and third together. Only macropterous females known to me (Type—*Pseudopamera forreri* Dist.).

Cœnopamera Barb.

FF. Preocular space to base of antenna not more than twice the length of the postocular space, most commonly subequal to it. Head strongly contracted back of eyes; apex extending to or beyond the middle of basal segment of antennæ which is very evidently shorter than first segment of rostrum, second segment much shorter than third and fourth together. Pronotum with the collar most commonly set off by an impressed line.

G. The two lobes of the pronotum commonly separated by a deep, clean cut, transverse constriction. First segment of rostrum commonly not reaching base of head. Postocular space of head commonly subequal to or sometimes a little shorter than space between antenna and eye. Hind tibia most commonly furnished with short bristles.

H. Second and third ventral abdominal segments furnished with two very finely strigose, opaque, lunate vittæ. . . . . *Ligyrocoris* Stål.

HH. Second and third ventral abdominal segments unprovided with lunate, strigose vittæ. (To include subgenus *Paromius longulus* Dall.) . . . . . *Orthœa* Dall.

GG. The two lobes of the pronotum commonly separated by a shallow obtuse constriction. First segment of rostrum commonly reaching base of head.

I. Posterior tarsus with basal segment fully three times as long as second and third together. Hind tibia provided with long rigid bristles only. Antennæ nearly nude. Form of body narrow elongate, with longer legs. Scutellum carinate throughout. (Type—*Perigenes costalis* Van Duz.)

Zeridoneus Barb.

II. Posterior tarsus with basal segment not more than twice as long as second and third together. Hind tibia with long setose hairs similar to those of antennæ and provided with a few rigid bristles apically. Form of body more broadly oval with shorter legs..... *Perigenes* Dist.

CC. Head not at all or scarcely exserted, commonly immersed to the eyes. Pronotum without a constricted ring-like collar, at most with anterior margin depressed or furnished with a series of punctures. Clavus with three rows of punctures.

J. Scutellum much longer than wide and posteriorly distinctly carinate. Pronotum strongly constricted to form two lobes, both of which are punctate; the disk of the anterior lobe sometimes more sparsely so. Posterior tarsus with the basal segment subequal to the second and third together. Species rarely pilose.

K. First segment of antenna longer, exceeding apex of tylus by one-half its length. Within anterior margin of pronotum depressed, punctate. Basal disk of scutellum depressed before a premedian transverse or crescentic ridge, posteriorly to which, carinate. Fore femora armed with several teeth. Males sometimes with fore tibia armed with a median tooth. In brachypterous forms the membrane may be almost or entirely wanting, the clavus flat, not deflected to the corium and the anterior lobe of the pronotum swollen and more than twice the length of the posterior. Species not at all or only slightly shining. (To include *Carpilis ferruginea* Stål. and *Sisamnes contractus* Dist.)..... *Ptochiomera* Say.

KK. First segment of antennæ short scarcely exceeding the tylus. Anterior margin of pronotum not depressed. Basal disk of scutellum depressed followed by a longitudinal carina. Incrassate fore femora armed with two or three preapical teeth one of which is frequently enlarged. In

brachypterous forms the membrane is only shortened, the clavus always deflected to the corium. Species very shining. (Type—*Rhyparochromus plenus* Dist.).....*Kolenetrus* Barb.

JJ. Scutellum subequilateral, posteriorly not distinctly carinate. Pronotum either not pilose and finely punctate in front, in which case it is not strongly constricted to form two lobes or the pronotum very pilose and obsoletely punctate in front and then strongly and obtusely constricted to form two lobes. Posterior tarsus with basal segment decidedly longer than second and third together. Species not at all or faintly shining.

L. Antennæ and dorsal parts very pilose. Pronotum longer than wide, strongly contracted back of the middle to form two lobes; the anterior lobe obsoletely and sparsely punctate. First segment of antenna longer exceeding apex of tylus by nearly one-half its length. Costal margin of corium gently convexed. Fore-femora provided with two or three minute preapical teeth and long setæ throughout. Clavus distinct and deflected to the corium. Membrane reaching the end of abdomen. Only macropterous forms known to me. (Type—*Valonetus pilosus* Barb.).....*Valonetus* Barb.

LL. Antennæ and dorsal parts not at all or very sparsely pilose. Pronotum lightly transverse or quadrate, finely and distinctly punctate, anterior *disk* sometimes impunctate, not strongly constricted to form two lobes. First segment of antenna short barely exceeding tylus. Fore femora armed with two or three minute teeth in the middle, tipped with long setæ. In brachypterous forms clavus connate with the corium, the membrane wanting and pronotum more quadrate. (*Esuris tergina* Stål and *castanea* Barb.).....*Esuris* Stål.

BB. Anterior lobe of pronotum three or four times as long as posterior lobe, with the transverse constriction between the lobes commonly shallow and obtuse or ill-defined. Head distinctly exserted; postocular space subequal to space between antenna and eye; most commonly not abruptly contracted back of eyes. Fore tibia of males provided with a submedian tooth. Antenna elongate; apex of head not attaining middle of basal segment; this segment subequal to basal segment of rostrum. Basal segment of posterior tarsus two or three times as long as second and third segments together. Membrane not entirely wanting in brachypterous forms.

M. Anterior lobe of pronotum impunctate, demarked from the posterior lobe by a transverse, impressed line; provided with a distinct ring-like collar. Basal segment of antenna with a few setose bristles. Ocelli absent. Fore tibial tooth of male at middle or posterior to the middle. Hind tibia provided inwardly and outwardly with rigid bristles. Basal segment of hind tarsus three times as long as second and third together. Larger species.

Cnemodus H. S.

MM. Anterior lobe of pronotum sparsely punctate, the two lobes separated by an obtuse sinus, not indicated by an impressed line; anterior margin depressed, punctate. Basal segment of antenna without setose bristles. Ocelli present. Fore tibial tooth of male anterior to middle. Hind tibia with a few setose bristles inwardly. Basal segment of posterior tarsus about twice the length of second and third together. Smaller species. (Type—*P. canadensis* Prov.).....*Pseudocnemodus* Barb.

Tribe Rhyparochromini.

A. Anterior margin of the pronotum provided with a distinct ring-like collar, behind which is a depressed series of punctures; lateral margins strongly keeled or lightly expanded

and reflexed; distinctly separated into two lobes by an obtuse constriction just before middle. Head not transverse, exserted, commonly contracted back of eyes, space between antenna and eye most commonly subequal to postocular space. Basal segment of antenna stout and long, apex of tylus not reaching middle of segment. Basal segment of rostrum reaching base of head, longer than basal segment of antenna. Clavus irregularly punctate. Anterior femora elongate, not strongly incrassate, armed beneath with three or four equidistant spines. Posterior tibia with short rigid bristles. Mostly macropterous forms. (To include genus *Balboa* Dist.).....*Ozophora* Uhl.

AA. Anterior margin of pronotum without a ring-like collar, at most faintly impressed or provided with a series of punctures within. Head transverse, not at all or very lightly exserted. Lateral margins of pronotum sometimes carinate but most commonly merely longitudinally impressed within the lateral margin of the propleura. Hind tibia without rigid bristles.

B. Pronotum with the lateral margins strongly carinate and reflexed; lightly transversely impressed just behind middle, both lobes punctate; posterior margin straight. Head short, wide, slightly exserted, suddenly and strongly contracted back of eyes. First segment of rostrum shorter than head, subequal to first segment of antenna. Scutellum subequilateral, equal to length of commissure. Swollen anterior femora provided with numerous small teeth. Anterior tibia strongly curved. Posterior tibia nude. Only macropterous forms known to me.....*Tempyra* Stål.

BB. Lateral margins of pronotum very lightly keeled and not reflexed or acute or only linearly impressed within the lateral margins of the propleura. Head not at all or most lightly exserted.

C. Pronotum distinctly transverse with disk of anterior lobe black; posterior lobe testaceous punctate with fuscous; lateral margin lightly carinate. Scutellum much longer than wide, a little longer than pronotum, posteriorly bivittate with pale. Dorsal parts dull, not pilose. Fore femora incrassate and armed with three or four stronger

and several smaller teeth distributed along almost entire length. Clavus with three rows of punctures, the middle series abbreviated. Macropterous forms only.

Peritrechus Fieb.

CC. Pronotum with both lobes concolorous or nearly so, most commonly ferrugineous or castaneous, rarely black, most commonly shining or somewhat so. Scutellum not bivittate with pale.

D. Third ventral suture of the abdomen straight and reaching the lateral margin. Head across eyes distinctly narrower than anterior margin of pronotum. Pronotum with lateral margins more or less strongly keeled, with impunctate anterior lobe as wide or wider than the much shorter posterior lobe. Scutellum subtransverse. Clavus broad, not deflected to the corium, sometimes connate with the corium. Membrane usually abbreviated or wanting. Only brachypterous forms known to me.

Plinthisus Latr.

DD. Third ventral suture of the abdomen curved anteriorly and not reaching the lateral margin. Head across eyes as wide or most commonly wider than the anterior margin of the pronotum, most frequently as wide as across rounded submargin.

E. Pronotum with both lobes very distinctly and closely punctate and at the same time with the lateral margins evidently carinate. Scutellum longer than wide. Fore femora unarmed.

F. Lateral margins of pronotum more strongly carinate. Eyes more projecting. Pronotum and hemielytra not pilose. Clavus with three rows of punctures.

Acompus Fieb.

FF. Lateral margins of pronotum narrowly carinate. Eyes less projecting. Pronotum and hemielytra pilose. Clavus with four series of punctures.

Stygnocoris D. and S.

EE. Pronotum with the entire anterior lobe or the disk only impunctate; lateral edge either very finely carinate or the propleura linearly and longitudinally impressed within the lateral margin. Scutellum equilateral.

Fore femora lightly incrassate, armed or unarmed. Very small species.

G. Scarcely shining. Form short and broad. Pronotum not strongly, transversely constricted to form two lobes; anterior disk impunctate; lateral edge very narrowly carinate. Basal segment of rostrum (in U. S. species) shorter than first segment of antenna. *Antillocoris* Kirk.

GG. Somewhat shining. Pronotum rather strongly transversely constricted; the anterior lobe impunctate; the lateral edge linearly impressed within the lateral margin of the propleura. Basal segment of rostrum subequal to the basal segment of antenna. Inner apical margin of corium sinuate. ("*Salacia*" *delineata* Dist.) ..... *Cligenes* Dist.

Tribe Beosini.

A. Lateral margin of the pronotum linearly and evenly expanded, not reflexed; expansion not widened between the two lobes which are not distinctly differentiated by a transverse constriction; pronotum transverse without a depressed collar. Head about as wide across the eyes as the diameter of anterior submargin of pronotum. Antenniferous tubercles, seen from the side, strongly oblique, almost perpendicular. Scutellum not carinate. Antennæ not incrassate; basal segment short, apical third extended beyond apex of head.

B. Dorsal parts not entirely black, either the lateral explanate margin of the pronotum, or commonly the posterior lobe of the pronotum pale, punctate with black, or the posterior margin of the pronotum conspicuously or the corium more or less pale. Species commonly dull not shining. Anterior margin of the pronotum nearly straight.

C. Explanate lateral margin of pronotum most commonly pale, neither punctate nor furnished with setæ. Scutellum rarely bivittate with pale. Antennæ sparsely pilose or almost nude. First segment of posterior tarsus distinctly longer but not twice as long as second and third segments together.

D. The posterior lobe of the pronotum and corium pale, distinctly and rather coarsely punctate with black; the lateral explanate margins pale; pronotum narrowed in front, the lateral margins gently rounded anteriorly. Antennæ pilose. Anterior tibia, especially in the male, curved at base..... *Trapezonotus* Fieb.

DD. The posterior lobe of the pronotum concolorous with the anterior lobe, not at all or obsoletely and finely punctate, black or at most with the posterior margin only pale. Corium for the most part pale, more or less infuscated. Lateral explanate margins of the pronotum most commonly pale, rarely black; pronotum less narrowed in front, the lateral margins more nearly parallel. Antennæ nearly nude. Anterior tibia nearly straight. (Type—*Trapezonotus rufipes* Stål and *Rhyparochromus sodalicius* Uhl. etc.)..... *Malezonotus* Barb.

CC. Explanate pale lateral margins of the pronotum, provided with a few punctures set with long setæ. Scutellum most commonly bivittate with pale. Antennæ provided with numerous setose hairs. First segment of posterior tarsus commonly subequal to the second and third together. *Sphragisticus* Stål.

BB. Entirely black, or the legs rarely pale. Subshining. Pronotum very transverse, not depressed p steriorly; anterior margin lightly concave. Third segment of the rostrum shorter than the second. Anterior femora armed with one large preapical spine, preceded and followed by one or two smaller spines. Clavus with four series of punctures, the two middle series abbreviated and confused. Posterior tarsus with basal segment subequal to second and third together. Macropterous forms only known to me. (*Aphanus umbrosus* Dist.)..... *Aphanus* Lap.

AA. Lateral margins of the pronotum more lamellarly expanded and plainly reflexed, the expansion widened between the two lobes which are very obviously separated by a transverse constriction; posterior lobe depressed and profusely punctate; anterior margin straight, within, provided with a depressed series of punctures. Head scarcely transverse; antenniferous tubercles, seen from the side, obliquely declivous. Anten-

næ incrassate; basal segment longer. Second segment of rostrum longer than third. Scutellum posteriorly, obtusely carinate. Posterior tarsus with basal segment almost twice as long as second and third together. Macropterous and brachypterous forms..... *Uhleriola* Horv.

Tribe Gonianotini Stål.

Lateral margins of pronotum widely laminate, wider than the diameter of the eye, not reflexed, pale and rather profusely punctate with fuscous. Pronotum very transverse, anterior margin gently arcuated, the anterior rounded angles projecting a little beyond eyes. Costal margin of the corium widely laminate, lightly reflexed and punctate with fuscous. Scutellum almost as long as the pronotum. Clavus irregularly punctate. Head transverse. Antennæ set close to the eyes. Space between antennæ and eyes about one-half the length of the eye. Posterior tibia furnished with setose bristles. Basal segment of posterior tarsus fully twice as long as second and third together. Only macropterous forms. *Emblethis* Fieb.

Tribe Lethæini Stål.

A. Pronotum with both lobes distinctly and closely punctate, the posterior lobe more coarsely so; lateral margins lightly expanded, more widely so between the lobes, slightly sinuate and commonly in part pale; anterior margin without a semblance of a collar, but area behind this somewhat depressed and profusely punctate. Costal margins of corium anteriorly widely expanded, and broadly reflexed. Eyes not in contact with anterior margin of pronotum. Basal segment of antenna shorter than head but well extended beyond its apex. Anterior tibia of males either strongly curved or bent and strongly expanded apically within and armed with one or two stout preapical teeth. Hind tibia without rigid bristles. Fourth abdominal ventral segment having the two anterior glandular, opaque spots without a third subapical spot.

B. Body not strongly depressed or flattened. Lateral margins of pronotum not strongly converging anteriorly, anterior angles strongly and rather abruptly rounded. Width of head across eyes much narrower than across rounded sub-

margin of pronotum. Lamellar lateral expansion very distinct on both lobes. Antennæ rather strongly pilose. Mesosternum not longitudinally sulcate. Basal segment of posterior tarsus distinctly longer than second and third segments together. Third ventral suture of abdomen strongly curved anteriorly and not reaching lateral margin.

Drymus Fieb.

BB. Body much flattened. Lateral margins of pronotum strongly converging anteriorly, anterior angles gently rounded. Width of head across eyes subequal to width across rounded submargin of pronotum. Lamellar lateral expansion less obvious on the anterior lobe. Antennæ not pilose. Mesosternum strongly sulcate. Basal segment of posterior tarsus subequal to second and third segments together. Third ventral suture of abdomen almost straight and reaching the lateral margin. . *Gastrodes* Westw.

AA. Pronotum with the anterior lobe impunctate or obscurely punctate. Anterior tibia of males not so strongly curved or bent or abruptly expanded at apex. Fourth ventral abdominal segment with or without the third subapical glandular opaque spot.

C. Dorsal parts dull. Anterior margin of pronotum depressed and commonly pale, limited behind by a row of punctures; lateral lamellar expansion noticeably wider between the two lobes, for the most part commonly pale. Fourth ventral abdominal segment without the third subapical spot. Hind tibia without long rigid bristles; at most with a few short setose bristles or pilose.

D. Pronotum much longer than wide; anterior lobe subquadrate and disk obsoletely punctate. Antennæ very long, slender and nude; first segment as long or a little longer than the head, longer than first segment of rostrum, apex of head not reaching middle point; third segment longer than fourth. Head submerged to the eyes; head across eyes as wide as anterior margin of pronotum. Lateral margins of pronotum and corium widely lamellarly expanded and broadly reflexed. Corium dorsally flattened not transversely convex. Scutellum longer than wide. Clavus distinctly widened posteriorly, rather closely and

irregularly punctate. Commissure nearly as long as scutellum. Bucculæ lightly elevated and extended posteriorly to meet on the middle line of eyes. Much swollen anterior femur armed with a single large subapical tooth between which and the apex are several small teeth. Posterior tibia furnished with a few fine short bristles, not at all pilose. Posterior tarsus with the basal segment twice as long as the second and third segments together. (Type—*T. genuinus* Barb.) ..... *Togodclentus* Barb.

DD. Anterior lobe of pronotum transverse, impunctate and most commonly black. Antennæ shorter; first segment shorter than head, subequal to or shorter than the first segment of rostrum, well extended beyond apex of head. Head most commonly lightly exserted. Lateral margins of pronotum and corium more narrowly expanded. Commissure distinctly shorter than scutellum. Clavus punctate in more regular series. Basal segment of posterior tarsus never twice as long as second and third segments together.

E. Species larger, most commonly 6 to 7 mm. long. First segment of antenna longer; apex of tylus not reaching middle of first segment. Head longer than width back of eyes. Lateral margin of pronotum commonly more or less pilose. Hind tibia with short fine bristles or pilose..... *Eremocoris* Fieb.

EE. Species smaller, commonly 3 to 4 mm. long. First segment of antenna shorter; apex of tylus reaching at least to the middle of this segment. Head shorter, length subequal to width back of eyes. Lateral margins of pronotum without long soft hairs. Hind tibia not pilose or furnished with short bristles.

Scolopostethus Fieb.

CC. Dorsal parts shining or somewhat shining. Lateral edge of the pronotum not obviously widened between the two lobes and most commonly not pale; each anterior angle of the pronotum provided with a long seta. Fourth ventral abdominal segment commonly furnished with an additional third subapical opaque spot. Scutellum longer than wide. Hind tibia furnished with rigid bristles.

F. The lateral edge of the pronotum concolorous, not definitely demarked or bordered by an impressed line, much compressed or acute and beneath strongly impressed within the lateral margin of the propleura; the lateral margins nearly straight and converging anteriorly; anterior and posterior margins straight. Width of head across eyes a little narrower than across anterior submargin of the pronotum. Basal segment of rostrum nearly equal to basal segment of antenna. Dorsal parts pilose.

G. Fore femora provided with a few tubercles and numerous long setæ. Antennæ somewhat incrassate. Basal segment of posterior tarsus nearly twice as long as second and third together. Hind tibia with strong bristles. Surface not strongly shining. *Cistalia* Stål.

GG. Fore femoræ provided with several minute preapical teeth with or without setæ. Antennæ not incrassate and pilose. Basal segment of posterior tarsus a little longer than second and third segments together, but never twice as long. Hind tibia with short fine bristles.

H. Pronotum very transverse, nearly twice as wide as long, posterior lobe sparsely punctate. Clavus deflected to corium and provided with three regular rows of punctures. Corium finely punctate. Antennæ set close to the eyes, antenniferous tubercles less than one-half the length of the eyes. Membrane reaching apex of abdomen. Only macropterous forms known to me. (Type—*Petissius diversus* Dist.)..... *Valtissius* Barb.

HH. Pronotum more lightly transverse, almost impunctate except behind anterior margin. Clavus almost flat, with four series of punctures. Corium sparsely punctate. Antennæ further removed from the eyes, antenniferous tubercles only a little shorter than the eyes. Membrane abbreviated. Dorsal parts very shining. Only brachypterous forms known to me. (Genus *Rhaptus* Stål?)..... *Xestocoris* Van D.

FF. Narrow lateral expansion of the pronotum sharply demarked and most commonly pale; not widened between the two lobes which are poorly differentiated from each other, merely posteriorly lightly depressed and sparsely punctate; pronotum transverse, the two sides subparallel. Head submerged to eyes; width of head across eyes much narrower than across anterior submargin of pronotum where the angles are rather abruptly rounded. Antennæ more slender. Posterior tibia with long rigid bristles. Basal segment of posterior tarsus a little longer than second and third together. Fore femora with several small subapical tubercles. Brachypterous and macropterous forms. (To include *Trapezus* Dist.) ..... *Cryphula* Stål.

ANOTHER *TOXOPTERA* FEEDING ON SEDGE (HOMOPTERA; APHIDIDÆ).

By A. C. Baker,
Washington, D. C.

During the summer of 1916, there appeared on the sedges in a little marsh at East Falls Church, some dark colored apterous aphids. These were kept under observation and some were transferred to rearing cages. From these, sexes and eggs were obtained in the fall. None of the eggs, however, hatched the following spring. Visits to the marsh were made too late to secure a supply of stem mothers. Apterous forms were secured in the second generation and from these alate forms were secured. In the key given by Davis[1] this species would fall under *aurantii* from its color and would be excluded from *scirpi* by the nature of the hairs present in that species. It is therefore recorded under a new name.

Toxoptera nigra sp. nov.

Alate vivipara.

The alate forms began to appear in the rearing cages in the third generation. It is quite possible, however, that lines from a sufficient number of stem mothers would show alate forms produced in

[1] Tech. Ser. No. 25, Pt. I, p. 8, U. S. D. A. Bur. Ent.

the second generation also. These forms are produced throughout the summer in the different generations, but toward fall they appear in very small numbers and when the sexes are appearing very few alate forms can be found. The alate forms either reproduce upon the plant on which they developed or fly to other plants of the same species.

Fourth instar (pupa). General color brownish black, the thorax somewhat pinkish or whitish brown, otherwise colored as in the apterous form. Antennæ with the following measurements: Segment III, 0.208 mm.; IV, 0.16 mm.; V, 0.16 mm.; VI (0.08+0.4 mm.); cornicles 0.192 mm.; antennal tubercles quite acute in front and armed with short stout spines; vertex similarly armed.

When cleared of the body fluids the abdomen and most of the thorax appear to be almost transparent. The antennæ, head, legs, wingpads and cauda are dusky and the cornicles dark brown.

Fifth instar (adult). General color deep brownish or purplish black. Antennæ somewhat lighter than the general body color. Abdomen and cauda sometimes of a dark greenish color. Cornicles black, sub-cylindric, slightly constricted near the tip and distinctly flanged. Legs with the base of the femora and most of the tibiæ yellowish or whitish. Measurements and sensoria as given in Table I.

TABLE I. MEASUREMENTS OF ANTENNÆ AND CORNICLES OF THE ALATE VIVIPARA.

Segment III.	Sensoria of Segment III.	Segment IV.	Sensoria of Segment IV.	Segment V.	Sensoria of Segment V.	Segment VI.	Cornicle.
0.304	13	0.192	5	0.176	2	0.08 +0.4	0.24
0.304	12	0.192	6	0.176	2	0.09 +0.432	0.24
0.288	13	0.192	5	0.192	2	0.096+0.432	0.24
0.304	10	0.208	7	0.208	2	0.08 +0.448	0.24
0.304	9	0.192	6	0.192	2	0.096+0.464	0.24
0.304	11	0.192	7	0.176	1	0.08 +0.432	0.24
0.32	10	0.224	6	0.176	2	0.08 +0.448	0.24
0.288	13	0.192	6	0.176	3	0.096+0.432	0.24
0.288	13	0.208	7	0.176	3	0.096+0.432	0.224
0.304	9	0.192	4	0.192	3	0.08 +0.432	0.24

When cleared of the body fluids the chitin is found to be marked as follows: The head, thorax, antennæ, cornicles and legs are marked as indicated above. The abdomen becomes clearly transparent with the exception of a row of rather large black patches on each lateral margin, each patch surrounding a spiracle. The cauda, and genital plates are likewise dusky. In some specimens one or two narrow dusky bands are present caudad of the cornicles.

Apterous Vivipara.

The apterous viviparous forms occur upon the sedges during most of the year. They produce large numbers of young, some of which become alate and others continue the apterous lines throughout the summer.

Fifth instar (*adult*). General color dark greenish black, some specimens dull while others are glossy. Antennæ, eyes and cornicles black. Distal extremities of the femora and tibiæ and the tarsi black, remainder of the legs yellowish. When mounted in balsam the abdomen appears greenish in color, and when cleared the abdomen and thorax are transparent with the exception of the cauda, anal and genital plates and small dots along the sides of the abdomen. Measurements of the appendages are given in Table II.

TABLE II. MEASUREMENTS OF ANTENNÆ AND CORNICLES OF APTEROUS VIVIPARA.

Segment III.	Segment IV.	Segment V.	Segment VI.	Cornicle.
0.288 mm.	0.192	0.16	(0.064+0.384)	0.288
0.272	0.192	0.176	(0.084+0.4)	0.288
0.288	0.176	0.176	(0.08 +0.416)	0.272
0.32	0.176	0.176	(0.096+0.432)	0.288
0.32	0.176	0.176	(0.096+0.432)	0.288
0.272	0.176	0.16	(0.08 +0.416)	0.272
0.256	0.192	0.176	(0.08 +0.432)	0.272
0.304	0.192	0.176	(0.096+0.368)	0.272
0.256	0.192	0.176	(0.096+0.368)	0.288
0.272	0.176	0.16	(0.08 +0.384)	0.272

Male.

The males of this species appeared in the breeding cages during the early part of November and remained in considerable numbers until cold weather put a check to their activities. In connection with these males a reference to those of *muhlenbergiæ* Davis will be of interest. Davis (l.c.) described the males of that species as apterous and gave an excellent figure. Baker and Turner[1] in referring to the male stated their belief that the individuals were intermediates. The structure of the thorax and the ocelli are well shown in the figure. Males of the present species indicate that this view is correct. Several specimens, evidently indicating the normal condition of the male, resemble the condition met with in the males of *muhlenbergiæ*. They possess more or less of the thoracic structure of the alate form and also the head, while the wings are entirely absent. Other specimens, however, are more distinctly intermediate in nature, having small pad-like structures representing the wings. One specimen was obtained in which fully formed wings were present. The entire life cycle as observed at Falls Church is spent upon the sedge and the eggs are laid upon these plants in the fall. The presence of alate forms in the viviparous generations and more particularly this peculiar intermediate condition of the males would seem to indicate that this habit of remaining upon the one host has not been of very long duration in this species. No truly apterous males have been observed and it appears from the intermediate nature of the wingless males that the species has not yet developed to the condition in which truly apterous males may be found. For the sake of convenience the wingless males will be called apterous though they still retain the muscles of flight and other related alar structures.

Apterous male: General color deep brownish black, the abdomen somewhat paler than the rest of the body, base of the femora and most of the tibiæ yellowish. Cornicles, anal and genital plates black.

Antennæ with the following measurements: Segment III, 0.384 mm.; IV, 0.192 mm.; V, 0.192 mm.; VI (0.08+0.4 mm.); Segment III, with 12 or 13 small circular sensoria in an uneven row, Segment IV with about the same number and Segment V with 9

[1]Proc. Ent. Soc. Washington, vol. 18, p. 10–14.

or 10. Cornicles 0.176 mm. long, tapering near the base, then very slightly enlarged, then again slightly tapering; distal extremity with a distinct flange and the entire cornicle distinctly imbricated. Hind tibiæ 0.656 mm. long. Ocelli present, thoracic structure suggesting that of an alate form. Length from vertex to tip of cauda 0.944 mm.

Intermediate male: General color similar to that of the apterous form, the abdomen, however, appears to be slightly lighter. Antennæ with the following measurements: Segment III, 0.304 mm.; IV, 0.192 mm.; V, 0.192 mm.; VI (0.08+0.416). Sensoria present as follows: Segment III, with about 22 circular sensoria not arranged in a row, IV, with about 20 sensoria, V, with about 16. Cornicle 0.192 mm. long, similar in shape to the cornicle of the apterous form. Wings represented by leaf-like structures about 0.368 mm. long and about 0.192 mm. wide. These structures sometimes show one or two veins. Head and thorax like that of the alate form. Hind tibiæ 0.672 mm. Length from vertex to tip of cauda 1.04 mm.

Alate male: Color similar to that of the forms previously described. Wings hyaline, veins and stigma dark. Antennæ with the following measurements: Segment III, 0.32 mm.; IV, 0.256 mm.; V, 0.256 mm.; VI (0.096 mm.+0.448 mm). Sensoria as follows: Segment III, with about 17 circular ones more or less in a row; IV, with about 17; V, with about 17. Forewing with the stigma near the distal extremity of the wing, so that it is quite curved on its costal margin, media once branched, cubitus distinct, anal absent, length 1.152 mm. Hind wing about 0.656 mm. long and with one oblique vein. Cornicles 0.16 mm. long, similar to those of the other forms already described. Hind tibia 0.672 mm.; length from vertex to tip of cauda 0.96 mm.

Found on the sedge in company with the oviparous females, often very close to the ground.

Ovipara.

The oviparous form occurs on the sedge at the same time as the males, and these forms are present depositing eggs until cold weather.

First instar. General color dusky with dark appendages. Antennæ of four segments with measurements as follows: Segment I,

0.032 mm.; II, 0.032 mm.; III, 0.128 mm.; IV (0.032 mm.+0.176 mm.). Beak reaching to the hind coxæ, cornicles 0.048 mm.

Second instar. Similar to the last in general color. Antennæ of five segments with the measurements as follows: Segment I, 0.048 mm.; II, 0.048 mm.; III, 0.112 mm.; IV, 0.08 mm.; V (0.048 mm.+0.224 mm.). Cornicles 0.08 mm. Beak reaching beyond the second coxæ. Hind tibia 0.272 mm.

Third instar. General color similar to that of the previous instar, excepting that it is somewhat darker in color. Antennæ of five segments, with measurements as follows: Segment I, 0.064 mm.; II, 0.048 mm.; III, 0.176 mm.; IV, 0.112 mm.; V (0.048 mm.+0.272 mm.); cornicles 0.112 mm. Hind tibia 0.368 mm.

Fourth instar. General color similar to that of the last instar. Antennæ of six segments with measurements as follows: Segment III, 0.224 mm.; IV, 0.16 mm.; V, 0.144 mm.; VI(0.08 mm.+0.368 mm.). Segments imbricated but without secondary sensoria. Cornicles 0.192 mm. long, tapering, but slightly swollen on the distal third and distinctly imbricated and flanged. Hind tibia 0.64 mm. long; slightly swollen and thickly covered with nearly circular, tuberculate sensoria; length from vertex to tip of cauda 1.76 mm. Type in U. S. National Museum.

A NEW SPECIES OF EVANIA FROM THE CAMEROONS (HYMENOPTERA; EVANIIDÆ).

By Charles T. Brues,
Bussey Institution, Harvard University.

In working over a collection of Evaniidæ from South Africa, I have had occasion to examine a very interesting species from Western Africa. This was contained in a collection of Parasitic Hymenoptera given me by Prof. R. Thaxter, and the type has been deposited in the Museum of Comparative Zoölogy in Cambridge.

Evania flavocoxalis sp. nov.

Length 5 mm. Black, the antennæ brown at the base; palpi, four anterior coxæ and trochanters, anterior side of anterior tibiæ and posterior coxæ below, except at apex, yellow. Wings hyaline with a brown tinge. Body very thinly pubescent, almost

bare, except the hind tibiæ and tarsi which are more strongly pubescent than usual. Head rugosopunctate above the ocelli; front excavated gently above the antennæ, the basin finely longitudinally striate, space between it and the eyes more coarsely striate; between the antennæ is a strong carina that extends upward and disappears before the ocelli; beneath the antennæ is a transverse carina that curves upward outside them and extends halfway to the ocelli; face with deep striæ that converge below; cheeks with striæ that curve toward the base of the mandibles; head behind the eyes with scattered punctures of variable sizes, impunctate near the posterior edge and on the occiput except close to the ocelli. Cheeks half as long as the eyes, the inner edges of which are divergent below; ocelli close together in a low triangle, the

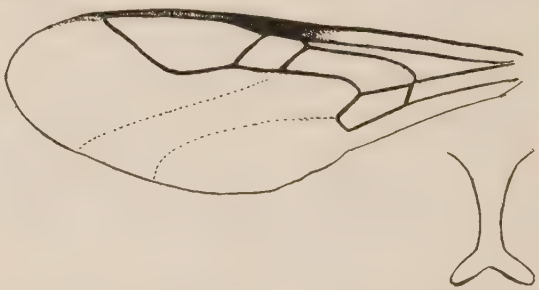


Fig. 1. *Evania flavocoxalis* sp. nov., fore wing and outline of metasternal process.

posterior ones larger than the anterior one, as far from one another as from the eye margin. Antennæ slender; third and fourth joints equal, each as long as the first two together and fully six times as long as thick. Mesonotum with distinct parapsidal furrows and with two other deep-grooved lines on each side external to the furrows; of these the inner one meets the furrow near its anterior end and the outer one meets the edge of the mesonotum just in front of the tegula; both attain the posterior margin of the mesonotum; surface of mesonotum irregularly punctate with coarse and fine punctures intermixed; smooth medially behind. Scutellum with large, well-separated punctures, smooth medially behind. Propodeum elongate, longer than the distance from its base to the anterior edge of the prothorax; not excavated behind, its posterior surface very gradually sloping, rounded off to the

base of the coxæ; evenly reticulate, coarsely so behind the insertion of the abdomen, finely so at the base. Pleuræ punctate-reticulate, the mesopleura with a long smooth space above that extends downward anteriorly. Metasternal process long and very narrow medially, its tines well-developed, widely divergent, and but slightly curved. Legs slender; hind coxæ microscopically transverse-reticulate; hind femora simple; hind leg not over twice as long as the body; longer spur of hind tibia half the length of the metatarsus. Petiole of abdomen coarsely obliquely striate except near the base. Wings with the basal vein lying closer than usual to the subcostal vein; cubitus arising very close to the junction of the basal and subcostal veins; nervulus interstitial with basal vein; radial vein meeting the subcosta at an acute angle; cubitus and subdiscoideus wanting beyond the cells. Hindwing with seven frenulum hooks.

This species is somewhat similar to *E. verrucosipes* Kieff. and might possibly be the male of that species which is known from the female only. However, the sculpture of the temples, scutellum, propodeum and petiole is entirely different and the thorax is nearly twice as long. From *E. cristatifrons* Kieff. also known from the female, it differs by the absence of the carina on the vertex and the pectinate process between the antennæ, by the sculpture of the petiole, and form of thorax. From *E. divergens* Kohl it is evidently distinct, although Kohl's description is very incomplete. The cheeks are shorter and the basal joints of the antennæ are much longer, and the color is different. The thorax is very much more elongate than in any other Evania that I have seen and the antennæ are more slender. The thorax is fully twice as long as high and the propodeum slopes gradually from base to tip, whereas it usually bends abruptly with an almost vertical posterior face.

THE BREEDING OF MOSQUITOES IN ALKALINE WATER.

By H. L. Ballowe.

Dr. C. S. Ludlow has sent the following note, quoted from a letter from Dr. H. L. Ballowe, Captain in the Medical Reserve Corps, U. S. Army at Fort St. Philip, Louisiana:

"A neighbor of mine at Buras, near the post, prepared a mixture of caustic soda to kill the San José Scale on his orange trees. After using a part of the barrel of the solution, the rest was left in a semi-protected location for about eight months. It was exposed to the weather and to some rains. On examining this barrel one day I found it teeming with larvæ and pupæ, both Anopheles and Culex. The alkali of the solution was marked to the taste, the color was a dark brown, and the solution affected litmus paper. I procured several jars of this solution and allowed the pupæ to complete development. The adults were seemingly normal."

EXCHANGE COLUMN.

Notices not to exceed four lines in length concerning exchanges desired of specimens or entomological literature will be inserted free for subscribers, to be run as long as may be deemed advisable by the editors.

Offered for cash, but exchange preferred. Fitch and early Illinois reports; Insect Life; Harris's Insect; many others.—J. E. Hallinen, Cooperton, Okla.

Histeridæ. North American Histeridæ identified or unidentified, desired in exchange for beetles of other families. F. G. Carnochan, Bussey Institution, Forest Hills, Massachusetts.

Hemiptera-Heteroptera. I desire specimens of this group from all regions especially New England. I will give in exchange species of this and other orders (except Lepidoptera), and will identify New England material. Correspondence desired.—H. M. Parshley, Smith College, Northampton, Mass.

Wanted: Psyche, Vol. IX, No. 300 (April, 1901). Address, giving price, Librarian, Stanford University, Cal.

Sarcophagidæ from all parts of the world bought or exchanged according to arrangement. North American material determined.—R. R. Parker, State Board of Entomology, Bozeman, Mont.

Wanted: Insects of any order from ant nests, with specimens of the host ants, from any part of the world; also Cremastochilinæ of the world. Will give cash or Coleoptera, Hymenoptera and Diptera from the United States.—Wm. M. Mann, Bussey Institution, Forest Hills, Boston, Mass.

Want to correspond with collectors of Noctiudæ in Northern Massachusetts. Subject to supply will pay any reasonable price for good specimens Catocola sappho.—Howard L. Clark, P. O. Box 1142, Providence, R. I.

Wanted: Old Series Entom., Bul. 1, 2, 3, 33; Technical Series 4, 6, 7; Insect Life, vol. 4–6; Jour. Applied Microscopy I, N. Y. State Entom. Rep. 3, 4; Fitch Rep. 7, 8, 13.—Philip Dowell, Port Richmond, N. Y.

Wanted: Insects of the family Embiidæ (Scoptera). I would give insects of any order except Lepidoptera. I would like to correspond with persons interested in this family.—Raoul M. May, 2202 W. 10th St., Los Angeles, California.

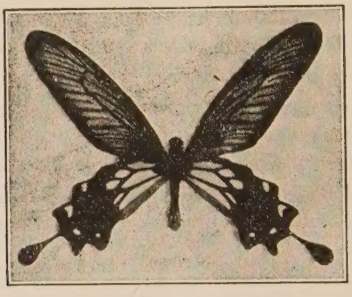
Wanted: To exchange, or purchase for cash, specimens of the Genus Apantesis from any locality. Also to purchase rare Catocalæ.—Samuel E. Cassino, Salem, Mass.

Wanted: 19th Illinois Entomological Report; Coleoptera of Southern California, by H. C. Fall; Notes on Lachnosterna of Temperate North America, by J. B. Smith; Complete Works of Thos. Say, Le Conte edition.—J. S. Wade, U. S. Bureau of Entomology, Washington, D. C.

Wanted for cash: Lowest representatives of all families of insects, preserved in fluid.—G. C. Crampton, Amherst, Mass.

Ward's Natural Science Establishment

84-102 College Ave., Rochester, N. Y.



Best equipped establishment in the United States for furnishing Entomological Supplies and Specimens

Special attention is called to our

American Ent. Insect Pins

Hand made Schmitt and other Insect boxes.

Cabinets and Exhibition Cases of the finest workmanship.

Life Histories of Insects of Economic Importance, in Riker Mounts, Pasteboard and Wooden Exhibition Cases, and Preparations in Alcohol.

Type, Mimicry and Protective coloration collections.

Collections of Household, Garden, Orchard, Forest, and Shade tree pests.

Fine specimens representing Sexual and Seasonal Dimorphism, and warning colors.

Our stock of Exotic Insects is unsurpassed, shipments from our collectors abroad arriving nearly every week.

The following lists are sent free on application:

116. Biological material for dissection.
125. Life histories of economic insects.
128. List of living pupae.
129. Exotic Lepidoptera.
130. North American Lepidoptera.
131. Exotic Coleoptera.
132. North American Coleoptera.
143. Type, Mimicry, etc., collections.
145. List of Pest collections.
147. List of Butterflies for trays and decorative work.
C-30. Catalogue of Entomological supplies.

Amer. Ent. Co. price list of Lepidoptera. 80 pages. Price 25c. Free to our customers.

New illustrated catalogue of Insects ready for distribution.

Ward's Natural Science Establishment

SUCCESSFUL Text and Reference Books that you want in your library and in your classes.

OPTIC PROJECTION

SIMON HENRY GAGE, Professor Emeritus of Histology and Embryology, Cornell University, and **HENRY PHELPS GAGE, Ph.D.,** Cornell University.

This is a very comprehensive work dealing fundamentally and practically with the Magic Lantern, the Projection Microscope, the Reflecting Lantern and the Moving Picture Machine. Library Binding. 730 pages. Over 400 figures. **Postpaid, $3.00**

HANDBOOK OF MEDICAL ENTOMOLOGY

WM. A. RILEY, Ph.D., Professor of Insect Morphology and Parasitology, Cornell University and **O. A. JOHANSEN, Ph.D.,** Professor of Biology, Cornell University.

A concise account of poisonous, parasitic and disease-carrying insects and their allies, including descriptions and illustrations of the principal species, with keys for their determination, and methods of control. Bound in Library Buckram, medium 8vo. 350 + VIII pages. Send for sample pages. **Price, $2.20 Postpaid**

THE MANUAL FOR THE STUDY OF INSECTS

J. H. COMSTOCK, Professor Emeritus of Entomology, Cornell University.

For past 20 years and still the leading college text. Now rapidly going into schools as a reference guide to insect study. 700 pages. 700 illustrations. Mailing weight, 4 lbs. **$3.75 Net**

THE NATURAL HISTORY OF THE FARM

J. G. NEEDHAM, Professor of Entomology, Cornell University.

A recent successful addition to Natural Science Literature. Well arranged for class work and for private study. 300 pages. Illustrated. **Postpaid, $1.50**

THE HANDBOOK OF NATURE-STUDY

A. B. COMSTOCK, Assistant Professor of Nature Study, Cornell University.

The most extensively used Nature-Study text before the public. Over 200 lessons on common birds, animals, insects, plants, trees, stars and the weather worked out in detail for teachers and pupils. 950 pages. 1,000 illustrations. Send for circular.

Bound in one vol., **$3.25 Net,** mailing weight, 5 lbs.
Bound in two vols., **4.00 Net,** mailing weight, 5½ lbs.

For sale at all book stores or shipped direct from

THE COMSTOCK PUBLISHING COMPANY, Ithaca, N. Y.

The Celebrated Original Dust and Pest-Proof

METAL CABINETS

FOR SCHMITT BOXES

These cabinets have a specially constructed groove or trough around the front, lined with a material of our own design, which is adjustable to the pressure of the front cover. The cover, when in place, is made fast by spring wire locks or clasps, causing a constant pressure on the lining in the groove. The cabinets, in addition to being absolutely dust, moth and dermestes proof, are impervious to fire, smoke, water and atmospheric changes. Obviously, these cabinets are far superior to any constructed of non-metallic material.

The interior is made of metal, with upright partition in center. On the sides are metal supports to hold 28 boxes. The regular size is 42½ in. high, 13 in. deep, 18¾ in. wide, inside dimensions; usually enameled green outside. For details of Dr. Skinner's construction of this cabinet, see Entomological News, Vol. XV, page 177.

METAL INSECT BOX has all the essential merits of the cabinet, having a groove, clasps, etc. Bottom inside lined with cork; the outside enameled any color desired. The regular dimensions, outside, are 9 x 13 x 2½ in. deep, but can be furnished any size.

WOOD INSECT BOX.—We do not assert that this wooden box has all the qualities of the metal box, especially in regard to safety from smoke, fire, water and dampness, but the chemically prepared material fastened to the under edge of the lid makes a box, we think superior to any other wood insect box. The bottom is cork lined. Outside varnished. For catalogue and prices inquire of

BROCK BROS., Harvard Square, Cambridge, Mass.

---

500 PIN-LABELS 25 CENTS! All Alike on a Strip

Smallest Type. Pure White Ledger Paper. Not Over 4 Lines nor 30 Characters (13 to a Line). Additional Characters 1 cent each, per line, per 500. Trimmed.

C. V. BLACKBURN, 12 Pine St., STONEHAM, MASS., U.S.A.

CAMBRIDGE ENTOMOLOGICAL CLUB

A regular meeting of the Club is held on the third Tuesday of each month (July, August and September excepted) at 7.45 P. M. at the Bussey Institution, Forest Hills, Boston. The Bussey Institution is one block from the Forest Hills Station of both the elevated street cars and the N. Y., N. H. & H. R. R. Entomologists visiting Boston are cordially invited to attend.